



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMERCIAL CENTER, EASTING LANE, DEALENS, VA  
WASHINGTON, DC 20540-0001  
\*\*\* FAX \*\*\*

APPLICATION NO	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO	CONFIRMATION NO
09 930,771	08/16/2001	Gang Yu	U A0024USDIV	2541

23906 7590 12/24/2002

E I DU PONT DE NEMOURS AND COMPANY  
LEGAL PATENT RECORDS CENTER  
BARLEY MILL PLAZA 25 1128  
4417 LANCASTER PIKE  
WILMINGTON, DE 19805

EXAMINER

LCU, THANH X

ART UNIT PAPER NUMBER

2878

DATE MAILED: 12/24/2002

Please find below and or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/930,771

Applicant(s)

YU ET AL

Examiner

Thanh X Luu

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on 16 August 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 13 and 15-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13 and 15-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 August 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.65(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This Office Action is in response to preliminary amendments filed August 16, 2001. Claims 13 and 15-38 are currently pending.

#### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the scintillating over layer of claim 27, the organic sensing layer of claim 29 and the buffer layer of claim 36 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

#### ***Specification***

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: An organic sensing layer that generates mobile electrons and holes in response to high energy ionized particles appears to not have been described in the specification.

#### ***Claim Objections***

3. Claim 26 is objected to because of the following informalities:

In claim 26, "plurality" is misspelled.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 26, 30-33 and 35-38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 30-33, 37 and 38 are dependent from a cancelled claim. Since the scope of the claims is unclear, the claims are not examined on their merits.

Regarding claim 26, "said array" lacks proper antecedent basis. It is unclear how many arrays are being claimed and which array is being referred to.

Regarding claim 35, it is unclear in its given context if "(optical etalon)" was intended to be a limitation or not.

Regarding claim 36, it is unclear if "an electrode" refers to the first or second electrode or an additional electrode.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 13, 15-17, 19-21, 23 and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Heeger et al. (U.S. Patent 5,504,323).

Regarding claim 13, 15-17, 19-21, 23 and 36, Heeger et al. disclose (see Figure 2) an organic photodiode detector comprising a photodiode and a voltage source (15'), the photodiode having a built-in potential and a prescribed photosensitivity range in response to incident radiation (19'), the photodiode comprising: a first electrode (12); a photoactive organic layer (11) disposed on the first electrode; a second electrode (13) disposed on the photoactive organic layer; and the voltage source (15') adapted to apply an operating biasing voltage across the first and second electrode, the biasing voltage operating to vary the prescribed photosensitivity range (see Figure 5 and column 12, lines 1-4). Heeger et al. further disclose (see Figure 2) a support substrate (14) upon which the first electrode (12) is disposed, wherein the support substrate and the first electrode are substantially transparent to the incident radiation (19'). Heeger et al. also disclose (see column 5, lines 25-40) the photoactive organic layer is comprised of a semiconducting conjugated polymer. The conjugated polymer selected from at least polyacetylene (see column 5, line 25-27). Heeger et al. also disclose (see column 5, lines 1-19) the conjugated polymer is the donor of a donor/acceptor polyblend, the acceptor being selected from an organic photoreceptor molecule or an electron transport molecule. Heeger et al. further disclose (see column 5, lines 45-65) the photoactive organic layer comprising a polymer/polymer polyblend. In addition, Heeger et al. disclose (see column 4, lines 66-67 and column 5, lines 1-19) the photoactive organic layer is arranged in a semiconducting heterojunction structure having at least one set of donor and acceptor regions disposed therein. Heeger et al. also disclose (see column 6, line 28-30) the first electrode comprises conducting polymer. Further,

since the device of Heeger et al. comprises a plurality of heterojunction layers, one of those layers inherently serves as a buffer layer.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heeger et al. (U.S. Patent 5,504,323) in view of Sariciftci et al. (U.S. Patent 5,331,183).

Regarding claim 18, Heeger et al. further disclose (see column 5, lines 1-10) the conjugated polymer is the donor of a donor/acceptor polyblend and the acceptor being an organic polymeric acceptor. Heeger et al. do not specifically disclose the specific types of acceptors as claimed. Sariciftci et al. teach (see column 5, lines 1-15) C<sub>60</sub> as being an acceptor and a conjugated polymer as the donor. Sariciftci et al. further recognize that C<sub>60</sub> is a superior acceptor. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide C<sub>60</sub> as an acceptor in the apparatus of Heeger et al. in view of Sariciftci et al. to provide better electron transfer and improve detection.

10. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heeger et al. (U.S. Patent 5,504,323) in view of Pei et al. (U.S. Patent 5,682,043)

Regarding claim 22, Heeger et al. disclose the device as set forth above. Heeger et al. do not specifically disclose the photoactive organic layer comprises optically inert

organic additives. Pei et al. teach (see column 6, lines 56-64) enhancing the operation of a polymer device by adding organic additives. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide an optically inert organic additive in the apparatus of Heeger et al. in view of Pei et al. to enhance and improve an operation of the apparatus.

11. Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heeger et al. (U.S. Patent 5,504,323) in view of Byker et al. (U.S. Patent 5,805,330).

Regarding claims 24 and 25, Heeger et al. disclose the device as set forth above. Heeger et al. do not specifically disclose an optical filter layer as claimed. Byker et al. teach (see Figure 1) an organic photodiode detector (22) having an optical filter layer (12 or 14) adapted to restrict transmission of incident radiation to a predetermined wavelength range (see also column 5, lines 5-10). Further, since the filter is transparent to at least a part of the visible light range, the spectral response follows that of the human eye. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide an optical filter as claimed in the apparatus of Heeger et al. in view of Byker et al. to protect the device from other harmful radiation.

12. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heeger et al. (U.S. Patent 5,504,323) in view of Hawkins et al. (U.S. Patent 5,889,277).

Regarding claim 26, Heeger et al. disclose the device as set forth above. Heeger et al. further disclose (see column 2, lines 35-38) forming an array out of the organic photodiode detectors. Heeger et al. do not specifically disclose the pixels detecting red,

green and blue radiation as claimed. Hawkins et al. teach (see Figure 1) an array of photodetectors detecting red, green and blue radiation. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide color detection as claimed in the apparatus of Heeger et al. in view of Hawkins et al. to further enhance the detection capabilities of the apparatus.

13. Claims 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heeger et al. (U.S. Patent 5,504,323) in view of Kuhlmann et al. (U.S. Patent 5,929,499).

Regarding claims 27-29, Heeger et al. disclose the claimed device as set forth above. Heeger et al. do not specifically disclose a scintillating over layer to emit photons in response to incident high energy ionized particles as claimed. Kuhlmann et al. teach (see column 1, lines 20-25) a scintillating over layer in a photodiode detector that converts high energy ionized particles, X-rays, into photons detected by the detector. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a scintillator as claimed in the apparatus of Heeger et al. in view of Kuhlmann et al. to provide further enhanced detection.

14. Claims 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heeger et al. (U.S. Patent 5,504,323) in view of Xu et al. (U.S. Patent 5,949,187).

Regarding claims 34 and 35, Heeger et al. disclose the device that acts as an electroluminescent device or a photovoltaic device as set forth above. Heeger et al. do not specifically disclose a mirror and microcavity as claimed. Xu et al. teach (see Figure 1) an organic electroluminescent device mirrors and a microcavity device for selective



response at resonant wavelengths. The microcavity inherently forms an optical etalon. Further, Xu et al. recognize that the microcavities allow for better color generation. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide an optical filter as claimed in the apparatus of Heeger et al. in view of Xu et al. to provide enhanced color generation as taught.

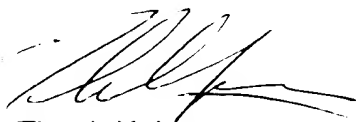
***Conclusion***

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh X. Luu whose telephone number is (703) 305-0539. The examiner can normally be reached on Monday-Friday from 6:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta, can be reached on (703) 308-4852. The fax phone number for the organization where the application or proceeding is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

txl  
December 18, 2002

  
Thanh X. Luu  
Patent Examiner